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ABSTRACT

Curriculum behavioral objectives for metric programs in grades K-8 are listed in this document. The objectives are organized according to topic and coded for grade level. The topics covered are: (1) language development; (2) comparison and ordering; (3) measurement/length; (4) measurement/volume; (5) measurement/mass; (6) measurement/temperature; (7) estimates; (8) calculations; and (9) general information. (MP)

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DISTRICT 147 METRIC EDUCATION PROGRAM

CURRICULUM BEHAVIORAL OBJECTIVES

SCOPE AND SEQUENCE K - 8

Metric Education Project
USOE March 1978
Doris Machtinger, Director
John Sawyer, III, Superintendent
Patricia West, Curriculum Director

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METRIC EDUCATION PROGRAM

LANGUAGE DEVELOPMENT (L)

1(Lk) The student will pronounce the words:

meter liter gram and degrees Celsius.

2(L1) Student will pronounce the words centimeter, kilogram.

3(L1) The student will select "meter"and "centimeter" as words related to measuring length; the student will select "liter" as a work related to measuring volume; the student will select "gram", "kilogram" as words related to measuring mass; the student will select "degree Celsius" as words related to measuring temperature.

4(L2) The student will pronounce the word decimeter.

5(L2) The student will read the words meter, decimeter, centimeter, liter, gram, kilogram and degrees Celsius.

6(L2) The student will select the abbreviation for the words meter, centimeter, decimeter, liter, gram, kilogram and degrees Celsius.

7(L2) The student will identify "meter", "centimeter", "liter", "gram", "kilogram", and "degrees Celsius" as metric words.

8(L3) The student will pronounce the prefixes milli, centi, deci, deca, hecto and kilo.

9(L3) The student will place the common prefixes on a place value chart.

10(L3) The student will identify the abbreviation km, cm, mm, mL, g, kg, and $^{\circ}C$ with the proper word forms.

11(L4) The student will state the metric prefixes milli, centi, deci, deca, hecto, kilo and state their meaning.

12(L4) The student will select the symbol that matches each prefix.

13(L4) The student will be able to pair prefixes and quantity terms in abbreviated form to express any metric measurement.

14(L6) The student will recognize these words and symbols:

km/h (kilometers per hour)
m/s (meters per second)
km/s (kilometers per second)

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LANGUAGE DEVELOPMENT (CONT.)

15(L6) The students will read metric road signs such as:

Speed 80 km/h Springfield 162km

16(L6) The student will spell, pronounce and define all the following metric terms properly:

millimeter	milliliter	are
centimeter	liter	hectare
decimeter	gram	stere
meter	kilogram	-decameter
hectometer	°Celsius	-kilometer

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COMPARISON AND ORDERING (C/O)

1(c/oK) The student will choose:

the larger (shorter) of two given objects relatively linear in nature

the bigger (smaller) of two areas

the bigger (smaller) of two easily compared solid objects

the heavier (lighter) of two masses (gross differences)

the hotter (colder) of two objects.

2(c/oK) The student will select an appropriate object from a group of familiar objects when asked to choose one "about as long as a meter stick".

3(c/ok) The student will order 3, 4, and 5 clearly comparable objects according to length, volume, mass or temperature.

4(c/ol) The student will directly compare two objects and classify one as "longer than", "shorter than" or "equal to" the other.

5(c/ol) The student will compare and order areas directly by covering. (gross comparisons)

6(c/ol) The student will compare and order mass directly using a simple scale.

7(c/ol) The student will compare and order capacity directly by pouring into comparable containers.

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METRIC EDUCATION PROGRAM

MEASUREMENT/LENGTH (ML)

1 (MLK) The student will select the meter stick, meter tapes or ruler as tools to measure length.

2 (ML1) The student will identify a meter stick.

3 (ML1) The student will identify the centimeter divisions on a metric ruler.

4 (ML1) The student will measure and record length concepts such as: long, short, tall, high, wide, etc., in terms of meter, centimeter (less than 30cm).

5 (ML1) The student will recognize a body part for the meter, and for the centimeter.

6 (ML1) The students will measure and order the length of two pictorial representations of objects less than 30cm long.

7 (ML2) The student will measure and order 2 line segments which may be longer than 1m using a meter stick or a meter tape, the answer to be written in centimeters.

8 (ML3) The student will construct a line of a given length in centimeters. (less than 30cm)

9 (ML3) The student will measure small objects to the nearest cm.

10 (ML3) Students will measure large distances and record the answer in meters.

11 (ML4) The students will measure to nearest mm.

12 (ML4) Students will measure and order area measurements in m^2, dm^2, and cm^2.

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METRIC EDUCATION PROGRAM

MEASUREMENT/VOLUME (MV)

1 (MV1) The student will select the liter measures to measure volume.

2 (MV1) The student will measure and record measurement of liquids such as milk and water in "liters"(units to be pre printed).

3 (MV2) The student will determine the capacity in whole liters of a given container by pouring with a liter cup.

4 (MV2) The student will fill a graduated beaker to the 1 liter mark.

5 (MV3) The student will measure liquid correctly to the nearest 100 ml using a calibrated beakers.

6 (MV3) Students will determine volume in cm^3 of a rectangular solid by counting or constructing a similar object with cm blocks.

7 (MV4) The students will fill a beaker to an arbitrary level.

8 (MV4) Students will compare and order measurements in cm^3 and L.

9 (MV6) The student will determine volume by displacement.

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MEASUREMENT/MASS (MM)

1 (MMK) The student will select the scale to measure mass.

2 (MM1) The student will measure and record measurement of mass in "grams" and "kilograms".(units to be preprinted)

3 (MM2) The student will determine the mass of a small object in grams, using a balance scale.

4 (MM3) The student will read his/her own weight in kg. (bathroom scale).

5 (MM4) The student will determine mass on a spring scale(platform, fish and bathroom).

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MEASUREMENT/TEMPERATURE (MT)

1 (MTK) The student will select the thermoneter to measure temperature.

2 (MT2) The student will read a Celsius thermometer.

3 (MT3) The student will identify freezing point, boiling point, normal body temperature and room temperature on a Celsius thermometer.

4 (MT4) The student will measure temperature to the nearest degree.

5 (MT4) Given an arbitrary temperature, students will indicate it on a Celsius thermometer.

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ESTIMATES (E)

1(E3) Students will estimate small lengths in centimeters.

2 (E3) Students will estimate and measure large (outdoor or classroom size) distances to the nearest meter.

3 (E6) Students will estimate lengths in m, cm and mm.

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CALCULATIONS (C)

1 (C) The student will state that there are 100 centimeters in a meter.

2 (C3) The student will determine the sum and difference of two like measures.

3 (C3) The student will state the decimal relationships between the common prefixes milli, centi, deci, deca, hecto and kilo.

4 (C4) The student will use the relationship:

1L=1000mL 1 kg=1000g 1m=1000mm 1m=100cm 1m=10dm

to convert down (i.e. L→ml kg→g m→dm cm→mm (easy problems)

5 (C4) Students will convert up when no decimal points are needed

(mm→cm→dm→m mL→L g→kg(easy problems)

6 (C4) Students will solve simple word problems.

7 (C5) The student will write metric measurement in decimal form.

8 (C5) The student will make conversions within the metric system.

9 (C5) The student will solve mixed denominational addition and subtraction problems expressed in decimal form.

10 (C5) The student will solve word problems that involve multiplication or division of whole numbers and metric measurements.

11 (C6) The student will perform multiplication and division operations on metric measurements in decimal notation.

12 (C6) The student will solve area and volume problems involving multiplication of metric measurement in decimal form.

13 (C6) The student will rename all common measurements in equivalent values including square and cubic units.

14 (CJ) The student will state metric prefixes from greater to lesser.

15 (CJ) The student will use metric measurements in simple algebraic equations.

16 (CJ) (Enrichment item) The student will interpret mixed data translating to a metric approximation using given formulae and relationships.

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METRIC EDUCATION PROGRAM

GENERAL INFORMATION (G)

1 (G3) The student will recognize the metric system as a measuring system comparable to the English system.

2 (G4) The student will identify the general correspondences: C^{o} - F^{o}

M - yd cm - in kg - lb L - qt

3 (G4) The student will be able to identify at least five situations in his environment that involve (metric) measurement.

4 (G5) The student will make the gross comparisons:

1m is a little more than 1 yd.

1L is a little more than 1 qt.

1 kg is a little more than 2 lbs.

1 cm is a little less than 1/2 in.

5 (GJ) The student will state the interrelationship between the units of length, volune and mass in the metric system.

6 ((GJ) The student will read and interpret charts, maps, graphs and diagrams stated in metric units.

7 (GJ) The student will identify common temperatures ranges (climatic ranges, oven temperature ranges, body temperature ranges, etc.) given in metric units.

8 (GJ) The student will use metric measurement in daily activities such as:

Home Economics; clothing sizes, shoe sizes, body measurement, pattern sizes, cooking quantites, cooking temperatures.

Industrial Arts; tool sizes, equipment sizes, material sizes.

Physical Education; metric standards whenever possible.

Other; all class projects and data interpretation.

9 (GJ) The student will describe the history of the metric system.

10 (GJ) The student will state the need for standard measurement.

11 (GJ) The student will explain the advantages of adopting the metric system (this is a temporary objectivies for the transition period).